

ATTACHMENT A

USEPA - NEW ENGLAND
REGIONAL ENVIRONMENTAL ANALYTICAL PROCUREMENT

STATEMENT OF WORK

FOR

INORGANICS

METALS, CYANIDE, TOTAL ORGANIC CARBON, TOTAL COMBUSTIBLE ORGANICS,
AND GRAIN SIZE DISTRIBUTION ANALYSES

Multi-Media, Multi-Concentration

Document Number IREAP-01.0

JULY 1998

STATEMENT OF WORK

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SUMMARY OF REQUIREMENTS

EXHIBIT A - SUMMARY OF REQUIREMENTS

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1.0 PURPOSE

The purpose of the Region I Inorganic Regional Environmental Analytical Procurement (REAP) is to provide analytical data for use by Region I U.S. Environmental Protection Agency (EPA) in support of its investigation and clean-up activities under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA). Other EPA Program Offices who have similar analytical data needs also use this service.

2.0 DESCRIPTION OF SERVICE

REAP provides for two components of analytical services within the framework of the contract. One analytical service component provides a contractual framework for laboratories to apply EPA REAP methods, which have been provided, for the isolation, detection and quantitative measurement of metals and cyanide in aqueous and soil/sediment/solid environmental samples; total organic carbon (TOC) in aqueous and soil/sediment/solid environmental samples; and total combustible organics (TCO) and grain size distribution in soil/sediment/solid environmental samples. In addition, two levels of quantitation limits, low and medium, for metals and cyanide in aqueous samples are available. The analytical service provides the methods to be used, and the specific contractual requirements by which EPA will evaluate the data. This analytical service utilizes inductively coupled plasma (ICP) atomic emission spectrophotometer (AES), graphite furnace atomic absorption spectrophotometer (AAS), flame AAS, and cold vapor AAS (or specific mercury analyzer) techniques for target analyte metals analyses; distillation units and spectrophotometer for cyanide analysis; TOC analyzer for total organic carbon analysis; muffle furnace for TOC determination; and an array of sieving units, stirring apparatus, hydrometer, and sedimentation cylinder for grain size distribution determination.

The target analyte list may be designated as all of the target analytes listed in Exhibit C, or a subset of those analytes, and will be indicated on the chain of custody accompanying each Sample Delivery Group (SDG). Whenever the ICP is utilized to analyze and report one or more target analytes, then aluminum, calcium, iron, magnesium, and all other analytes determined to be a spectral interference (as specified in Exhibit E, section 5.13) shall also be analyzed and reported with the samples in the SDG in accordance with the requirements of this contract.

The second component of the contract is Labor Hour Pool (LHP). This component provides the Contractor and the Agency with a means of addressing problematic field samples within the contractual framework of the analytical service requirements.

3.0 DATA USES

This analytical service provides data which EPA uses for a variety of purposes, such as determining the nature and extent of contamination at a hazardous waste site, assessing priorities for response based on risks to human health and the environment, determining appropriate cleanup actions, and determining when remedial actions are complete. The data may be used in all stages in the investigation of a hazardous waste site including site inspections, Hazard Ranking System scoring, remedial investigations/feasibility studies, remedial design, treatability studies, and removal actions. In addition, this service provides data that are available for use in Superfund enforcement/litigation activities.

Exhibit A
Summary of Requirements

4.0 SUMMARY OF REQUIREMENTS

4.1 Introduction to the SOW

This statement of work (SOW) is designed as part of the documentation for a contract between Region I EPA and a commercial laboratory performing analyses in support of EPA Superfund programs. The SOW comprises seven exhibits. Exhibit A provides an overview of the SOW and its general requirements. Exhibit B contains a description of the reporting and deliverables requirements in addition to the data reporting forms and the forms instructions. Exhibit C specifies the target analyte list for this SOW with the Contract Required Quantitation Limits (CRQLs). Exhibit D details the specific analytical procedures to be used with this SOW and resulting contracts. Exhibit E provides descriptions of required quality assurance/quality control (QA/QC), standard operating procedures (SOPs), and procedures used for evaluating analytical methodologies, QA/QC performance, and the reporting of data. Exhibit F contains chain-of-custody and sample documentation requirements which the Contractor shall follow. To ensure proper understanding of the terms utilized in this SOW, a glossary is provided in Exhibit G. (When a term is used in the text without explanation, the glossary definition shall be applicable.)

4.2 Overview of Major Task Areas

For each sample, the Contractor shall perform the tasks described in this section. Specific requirements for each task are detailed in the exhibits as referenced.

4.2.1 Task I: Chain-of-Custody

4.2.1.1 Chain-of-Custody.

The Contractor shall receive and maintain samples under proper chain-of-custody procedures. The Contractor shall develop and follow all associated document control and inventory procedures. Documentation, as described herein, shall be required to show that all procedures are being strictly followed. This documentation shall be reported as the Complete Sample Delivery Group File (CSF) (see Exhibit B). The Contractor shall establish and use appropriate procedures to handle confidential information received from the Agency. See Exhibit F for specific requirements.

4.2.1.2 Sample Scheduling/Shipments

Sample shipments to the Contractor's facility will be scheduled and coordinated by the Region I Sample Control Center (RSCC). The Contractor shall communicate with the RSCC personnel by telephone, as necessary throughout the process of sample scheduling, shipment, analysis and data reporting, to ensure that samples are properly processed.

4.2.1.2.1 Samples will be shipped routinely to the Contractor through an overnight delivery service. However, as necessary, the Contractor shall be responsible for any handling or processing required for the receipt of sample shipments, including pick-up of samples at the nearest servicing airport, bus station or other carrier service within the Contractor's geographical area. The Contractor shall be available to receive sample shipments at any time the delivery service is operating, including Saturdays and Sundays.

- 4.2.1.2.2 If there are problems with the samples (e.g., mixed media, containers broken or leaking) or sample documentation/paperwork (e.g., Traffic Reports not with shipment, sample and Traffic Report numbers do not correspond), the Contractor shall immediately contact the RSCC for resolution. The Contractor shall immediately notify the RSCC regarding any problems and laboratory conditions that affect the timeliness of analyses and data reporting. In particular, the Contractor shall notify the RSCC personnel in advance regarding sample data that will be delivered late and shall specify the estimated delivery date.
- 4.2.1.2.3 To effectively monitor the temperature of the sample shipping cooler, a sample shipping cooler temperature blank will be included with each cooler shipped. The temperature blank will be clearly labeled: USEPA COOLER TEMPERATURE INDICATOR.
- 4.2.1.2.3.1 The Contractor shall use the USEPA supplied cooler temperature indicator bottle to determine the cooler temperature. The temperature of the cooler shall be measured at the time of sample receipt by the Contractor.
- 4.2.1.2.3.2 The temperature of the sample shipping cooler shall be measured and recorded immediately upon opening the cooler, and prior to unpacking the samples or removing the packing material. The cooler temperature indicator bottle will be located in the right hand corner, next to the hinge.
- 4.2.1.2.3.3 To determine the temperature of the cooler, the contractor shall locate the cooler temperature indicator bottle in the sample shipping cooler, remove the cap and insert a calibrated thermometer into the cooler temperature indicator bottle. Prior to recording the temperature, the Contractor shall allow a minimum of 3 minutes, but not greater than 5 minutes for the thermometer to equilibrate with the liquid in the bottle. At a minimum, the calibrated thermometer ($\pm 1^{\circ}\text{C}$) shall have a measurable range of 0 to 50 degrees Celsius. Other devices which can measure temperature may be used if they can be calibrated to $\pm 1^{\circ}\text{C}$ and have a range of 0 to 20°C .
- 4.2.1.2.3.4 If the temperature of the sample shipping cooler's temperature indicator exceeds 10 degrees Celsius, the contractor shall contact the Region I Sample Control Center (RSCC) and report the cooler temperature. The RSCC will contact the contractor who shipped the samples for instructions on how to proceed. The Region will either require that no sample analysis(es) be performed or that the Contractor proceed with the analysis(es). The RSCC will in turn notify the laboratory of the Region's decision. The laboratory shall document the Region's decision in the SDG narrative. Also, in the SDG narrative, the laboratory shall list by fraction and the USEPA sample number, all samples which were shipped in a cooler which exceeded 10 degrees Celsius.
- 4.2.1.2.3.5 The Contractor shall record the temperature of the cooler on the DC-1 Form, under Item #3 - Cooler Temperature, and in the SDG narrative.

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- 4.2.1.2.4 The Contractor shall accept all samples scheduled by the Region, with the intent that all samples will be analyzed within the contract required holding times and data delivered to the Region within the contractually designated time frame. Should the Contractor elect to accept additional samples, the Contractor shall remain bound by all contract requirements for analysis of those samples accepted.
- 4.2.1.2.5 The Contractor shall be required to routinely return sample shipping containers (e.g., coolers) to the appropriate sampling office within fourteen (14) calendar days following shipping receipt. The Contractor will be provided a shipping mechanism by the originating sampler or EPA (e.g., field samplers).
- 4.2.1.2.5.1 The Contractor shall ensure that the account numbers provided are used only for the return of Government owned shipping containers (e.g., coolers). Laboratories shall remove packing and other materials from the coolers before each pickup and shall ensure that the coolers are clean. The Contractor shall determine from visual inspection whether the cooler is clean. An authorized laboratory official shall sign and telefax the pickup record(s) to the designated transportation contractor or sampler within two (2) calendar days of cooler pick-up for return.

4.2.2 Task II: Analysis of Samples

4.2.2.1 Overview

Sample analyses will be scheduled by groups of samples, each defined as a Case and identified by a unique EPA Case number assigned by the RSCC. A Case signifies a group of samples collected at one site or geographical area over a finite time period, and will include one or more field samples with associated blanks and QC samples. Samples may be shipped to the Contractor in a single shipment or multiple shipments over a period of time, depending on the size of the Case.

- 4.2.2.1.1 A Case consists of one or more Sample Delivery Group(s). A Sample Delivery Group (SDG) is defined by the following, whichever is most frequent:
- Each Case of field samples received, OR
 - Each 20 field samples within a Case, OR
 - Each 14 calendar day period (7 calendar day period for 14-day data turnaround contracts) during which field samples in a Case are received (said period beginning with the receipt of the first sample in the SDG).
- 4.2.2.1.2 A Case will have Spike (S) and Duplicate (D) samples indicated on the sampling paperwork. There will usually be one spike and duplicate sample set per SDG. The EPA may require additional spike and duplicate sample analyses, upon Regional request, for which the Contractor will be paid.
- 4.2.2.1.3 Samples may be assigned to SDGs by matrix (i.e., all soils in one SDG, all aqueous samples in another), at the discretion of the laboratory. Such assignment shall be made at the time the samples are received, and shall not be made retroactively. Note that PE samples received within a Case shall be assigned to an SDG containing field samples for that Case.

4.2.2.2 Preparation Techniques

Prepare samples as described in Exhibit D. For target analyte metals (except mercury), samples are digested with acid, heated, filtered, and the digestate is analyzed by furnace AA, flame AA, and/or ICP. Preconcentration of Low Level aqueous samples (i.e., the Low Level digestion procedure) is permitted only if MDLs cannot meet the Low Level CRQL requirements (Exhibit C) using the Medium Level digestion procedure and the most sensitive instrumental technique among those specified in Exhibit D. For mercury analysis, organic mercury compounds are oxidized with potassium permanganate and potassium persulfate, and the mercury is reduced to the elemental state and aerated from solution in a closed system. The mercury vapor passes through a cell where absorbance is measured by AA. For cyanide analysis, the cyanide as hydrocyanic acid is released from cyanide complexes by means of a reflux-distillation operation and absorbed in a scrubber solution containing sodium hydroxide. The cyanide ion in the solution is measured using the manual or semi-automated spectrophotometric technique. Samples for TOC undergo a persulfate-ultraviolet oxidation reaction for aqueous samples or pyrolysis for soil/sediment/solid samples after which the total organic carbon is determined using a TOC analyzer. Soil/sediment/solid samples are air-dried, oven-dried, and ignited in a muffle furnace to determine TCO. Grain size distribution is determined by fractionation using an array of sieves and a sedimentation process using a hydrometer.

A Labor Hour Pool (LHP) portion is also included within the contractual framework, which may require additional preparation and/or cleanup techniques as deemed necessary to provide a means of addressing problematic field samples.

4.2.2.3 Analytical Techniques. The target analytes listed in Exhibit C shall be identified and quantitated as described in the methodologies provided in Exhibit D. Automated computer programs may be used to facilitate the identification and quantitation of the target analytes.

4.2.2.3.1 The Contractor shall communicate with the Project Officer or designee by telephone, as necessary, throughout the process of sample preparation and analysis to ensure that samples are properly processed to meet all technical acceptance criteria set forth in the SOW.

4.2.2.4 Qualitative Verification and Quantitation of Target Analytes. Prior to analysis by ICP, the analyst shall verify that the instrument configuration and operating conditions satisfy the analytical requirements set forth in the SOW. The analyst must compensate for spectral interferences to the target analyte. The background correction technique must compensate for variable background contribution to the determination of the target analytes. Spectral interferences from overlap of another element's spectral line must be corrected for by use of interelement correction factors. These correction techniques for spectral interferences must be verified by an analyst competent in the interpretation of ICP data (ICP spectroscopist).

4.2.2.4.1 The Contractor shall quantitate target analytes in accordance with techniques stipulated in Exhibit D and E. The Contractor shall calibrate instruments using the methods specified in Exhibit D and E.

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Summary of Requirements

- 4.2.2.5 Quality Assurance/Quality Control Procedures. The Contractor shall strictly adhere to all specific QA/QC procedures prescribed in Exhibits D and E. Records documenting the use of the protocol shall be maintained in accordance with the document control procedures prescribed in Exhibit F, and shall be reported in accordance with Exhibit B.
- 4.2.2.5.1 The Contractor shall maintain a Laboratory Quality Assurance Plan (LQAP) with the objective of providing sound analytical chemical measurements. This program shall incorporate the quality control procedures, any necessary corrective action, and all documentation required during data collection as well as the quality assessment measures performed by management to ensure acceptable data production.
- 4.2.2.5.2 Additional quality control shall be conducted in the form of the analysis of performance evaluation (PE) samples submitted to the laboratory by the Agency. The results of all such quality control or PE samples shall be used as the basis for an equitable adjustment to reflect the reduced value of the data to the Agency or rejection of data for: sample(s), a fraction within an SDG, or the entire SDG, and/or may be used as the basis for contract action. "Compliant performance" is defined as that which yields correct analyte identification and concentration values as determined by the Agency, as well as meeting the contract requirements for analysis (Exhibit D and E), quality assurance/quality control (Exhibit E), data reporting and other deliverables (Exhibits B), and sample custody, sample documentation and standard operating procedure documentation (Exhibit F).
- 4.2.3 Task III: Reporting Requirements
- 4.2.3.1 EPA has provided to the Contractor formats for the reporting of data (Exhibit B). The Contractor shall be responsible for completing and returning analysis data sheets in the format specified in this SOW and within the time specified in the Contract Performance/Delivery Schedule in Exhibit B.
- 4.2.3.2 Use of formats other than those designated by EPA will be deemed as noncompliant. Such data are unacceptable. Resubmission in the specified format shall be required at no additional cost to the Agency.
- 4.2.3.3 Computer-generated forms may be submitted in the hardcopy data package(s) provided that the forms are in **exact EPA format**. This means that the order of data elements is the same as on each EPA-required form, including form numbers and titles, page numbers and header information.
- 4.2.3.4 The data reported by the Contractor on the hardcopy data forms submitted by the Contractor shall contain accurate information. If discrepancies are found during government inspection, the Contractor shall be required to resubmit the hardcopy forms at no additional cost to the Agency.
- 4.3 Technical and Management Capability
- 4.3.1 Personnel
- The Contractor shall have adequate personnel at all times during the performance of the contract to ensure that EPA receives data that meet the terms and conditions of the contract.

4.3.2 Instrumentation

The Contractor shall have sufficient ICP/flame AA, furnace AA, CVAA, spectrophotometer, reflux-distillation apparatus, TOC analyzer, sieving units, sedimentation cylinder, stirring apparatus, and hydrometer capability to meet all the terms and conditions of the contract. A Labor Hour Pool (LHP) portion is also included within the contractual framework, which may require additional preparation, cleanup and/or instrumental analytical techniques as deemed necessary to provide a means of addressing problematic field samples.

4.3.3 Facilities

The Contractor shall maintain a facility suitable for the receipt, storage, analysis, and delivery of the product meeting the terms and conditions of the contract.